

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**STREAM HABITAT IMPROVEMENT AND MANAGEMENT**

(Acre)

CODE 395

**DEFINITION**

Maintain, improve, or restore physical, chemical and biological functions of a stream.

**PURPOSES**

1. Provide suitable habitat for desired aquatic species and diverse aquatic communities
2. Provide channel morphology and associated riparian characteristics important to desired aquatic species
3. Provide aesthetic values and recreation opportunities associated with stream habitats such as angling and fish viewing

**CONDITIONS WHERE PRACTICE APPLIES**

Streams where habitat deficiencies limit survival, growth, reproduction, and/or diversity of aquatic species in relation to the potential of the stream.

**Criteria Applicable To All Purposes**

All measures implemented under this practice shall comply with all applicable federal, state and local laws, rules and regulations. ***The owner or operator shall be responsible for securing all required permits or approvals including, but not limited to, permits pertaining to the Clean Water Act sections 404 and 401, Public Lands Corporation and sedimentation and erosion control.*** All required permits will be obtained prior to installation of any stream improvement measures. ***Any permit requirements will be incorporated into the design, operation and/or maintenance requirements.***

All activities will occur within the respective state's guidelines on timing with regard to breeding and nesting seasons of aquatic and terrestrial organisms ***or as specified by the WV Division of Natural Resources District Fishery Biologist.***

***Improvements in trout streams shall be installed only in streams with suitable water quality. Follow design guidelines in the Biology technical guide reference "Fish Habitat Improvement for Trout Streams" or as directed by the local West Virginia District Fishery Biologist.***

Adjoining riparian corridors shall be managed with diverse ***native*** vegetation suitable for the site conditions and desired ecological benefits such as stream temperature moderation; recruitment of instream large wood and fine organic debris; input of riparian nutrients and terrestrial insects; streambank stability; and flood attenuation. ***Refer to NRCS WV conservation practice standard Riparian Forest Buffer (391) or Riparian Herbaceous Buffer (390).***

***Stream habitat management shall be applied within the context of the overall watershed conditions and with clear objectives for stream management goals.***

No action shall have long-term adverse impacts on endangered, threatened, or candidate species or species of concern.

***A soils investigation will be performed prior to installation of any structure and channel stability will be evaluated to ensure that excessive streambank scour and erosion will not occur.*** Structures installed using this standard for any of the purposes will not reduce channel capacity to the extent that

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Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

excessive bank erosion or unintentional lateral channel migration is induced.

Where practical, stream habitat and channel forming processes such as natural meandering and floodplain functions will be restored or maintained.

Instream structure design should be compatible with the dynamic nature of rivers and recreational and other uses of the stream corridor.

Where present, livestock shall be managed to prevent streambank erosion, bank trampling, over-grazing, and contamination of the stream from livestock waste.

***Planned structures and management shall emphasize the establishment of an ecologically self-sustaining stream-riparian-system consistent with the watershed conditions and landscape setting.***

#### **Additional Criteria Applicable To Purposes 1 and 2**

Instream structures will be designed to facilitate establishment and viability ***of the natural riparian plant community.***

Structural stream improvement measures applied will be compatible with the stream's ***landscape setting.***

The stream channel being managed under this practice shall:

- be hydrologically connected to its floodplain and associated wetlands where physically possible and appropriate.
- have sediment transport processes characteristic of a designed stable channel.
- have well vegetated banks and a healthy riparian root zone.
- have stream bottom substrates suitable for spawning and/or rearing of the desired aquatic species.

Incorporation of these stream channel criteria will generally involve restoration of an appropriate channel width-to-depth ratio, suitable riffle-pool complexes, well-vegetated banks, and/or stream length-gradient

relationships in a meandering stream consistent with local conditions and stream geomorphology (see reference 1).

#### **Additional Criteria Applicable To Purpose 3**

Recreational and other land use activities will be managed to minimize impacts on stream corridor vegetation and water quality.

#### **CONSIDERATIONS**

Stream habitat management provisions should be planned in relation to other land uses that may impact stream habitat.

Design and implementation of stream habitat improvements should consider the known or expected problems within the watershed such as, point and non-point source pollution, land management activities, and other watershed-related concerns.

Instream structures such as flow deflectors may be considered to provide stream stability and/or habitat elements until the channel and adjacent riparian area can function as a habitat of complex stream structure in dynamic equilibrium. There are several options that can be used singularly or in combination to improve stream habitat:

1. Through watershed planning, establish soil conservation, nutrient management, and pesticide management practices and other management techniques for non-point sources of pollution.
2. Reduce or manage excessive runoff due to watershed development.
3. Restore or protect riparian and floodplain vegetation and associated riverine wetlands.
4. Maintain suitable flows for aquatic species and channel maintenance.
5. Provide physical habitat components important to aquatic species such as sediment-free spawning gravel, boulders, large wood, resting pools, overhead cover, and stable banks.
6. Eliminate fish and aquatic life passage barriers such as improperly installed culverts (***see USACE Nationwide Permits, West Virginia 401 Water***

**Quality Certification Special Conditions, Appendix A. "Culvert Installation Recommendations to Fully Comply with Aquatic Life Passage".)**

7. Consider providing barriers/screens to exclude fish and other aquatic species from water pumps, diversion ditches, or any area where unintentional entrapment could occur.
8. **Where appropriate, improve floodplain-to-channel connectivity including off-channel habitats.**
9. Provide alternative streamside access for recreational use, livestock and equipment.

**Environmental Impact Concerns**

Stream habitat management will improve aquatic habitats and subsequently benefit endangered or threatened species or species of concern and other native aquatic species dependent on this environment. There may be short-term negative impacts when instream construction activities occur, i.e. sedimentation and turbidity. Therefore, timing of project activity is extremely important to reduce negative impacts.

Consider cultural resources when planning. This practice may adversely affect cultural resources and should comply with GM 420, Part 401, during planning, installation and maintenance.

**Suitable environmental documentation is required including but not limited to the WV CPA-052 documenting impacts to stream and adjacent resources.**

**PLANS AND SPECIFICATIONS**

Plans and specifications shall be in keeping with this standard and shall describe the details adequately to apply the practice to achieve its intended purpose.

**At a minimum the plan shall include but is not limited to:**

- **any drawings and/or job sheets that document quality, quantity, placement and dimensions of structures. All component practices and their respective specifications.**

- **timing and location of practices and management strategies.**
- **a soils investigation of the proposed area of improvement and/or management**
- an assessment of the watershed conditions that affect the physical, biological, and chemical conditions of the stream and its riparian area (see reference 1).
- an assessment of current stream and riparian conditions. This assessment shall evaluate channel morphology, **landscape** setting, aquatic species, riparian and/or floodplain conditions, and any habitat limitations including restriction of upstream and downstream movement of aquatic species (see reference 1).
- the aquatic species and life history stage for which the stream is being managed.
- **if applicable, methods for fish passage and other aquatic species (including stream organic matter) upstream and downstream. Refer to USACE Nationwide Permits, West Virginia 401 Water Quality Certification Special Conditions, Appendix A. "Culvert Installation Recommendations to Fully Comply with Aquatic Life Passage".**
- **any required permits and agency contacts.**

**OPERATION AND MAINTENANCE**

An operation and maintenance plan shall be developed for all applications. The plan shall provide for periodic inspection and prompt repair should the application of practices cause streambank or streambed instability.

**All vegetative and structural measures shall at a minimum be evaluated on an annual basis and after high water events.**

**Additional periodic monitoring may be required to determine the effects of this practice on stream stability, capacity, temperature and sediment transport as appropriate.**

## REFERENCES

1. **NEH-653 - Stream Corridor Restoration: Principles, Processes, and Practices.** *Federal Interagency Stream Restoration Working Group (FISRWG) (15 Federal agencies of the US Government).* *Stream Corridor Restoration Handbook.* October 1998.

[http://www.usda.gov/stream\\_restoration/sc\\_rhimage.htm](http://www.usda.gov/stream_restoration/sc_rhimage.htm)

2. **Houser, D.F. and Lutz, K.J., Fish Habitat Improvement for Trout Streams.** *Pennsylvania Fish & Boat Commission,* 1999. *PFBC Harrisburg, PA.*

3. **Helfrich, L.A., Weigmann, D.L. Landowner's Guide to Managing Streams in the Eastern United States,** *VA Cooperative Fish and Wildlife Research Unit,* Publication Number 420-141, December 1998.

4. **USACE., *Nationwide Permits for West Virginia, 401 Water Quality Certification Special Conditions. Appendix A. "Culvert Installation Recommendations to Fully Comply with Aquatic Life Passage".*** 2002

**\* Bold italics indicate modifications of the National Standard by WV.**

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**Sample Practice Narratives**

**395-Stream Habitat Improvement and**

**Management –A–**This stream will be restored and/or managed by installing various structural practices that improve geomorphic characteristics such as width-to-depth ratio, lateral meander migration, aquatic life passage, riffle-pool ratios and streambank erosion. Consult the attached drawing(s), jobsheet(s) and/or specifications for establishment and maintenance of this practice. Installation and implementation of this practice may be subject to approval by the WVDNR Fisheries Biologist and/or other regulatory agencies all structures will be implemented in consultation with WVDNR. Any required permits will be obtained prior to installation. Additional component practices may be required to fully implement this practice.

**395-Stream Habitat Improvement and**

**Management –B–**Impacts to water quality will be controlled by installing measures that reduce or eliminate point and non-point source pollutants, livestock access, runoff and/or sedimentation to enhance the habitat for the specified aquatic specie(s). Implementation and/or timing of this practice may be subject to approval by the WVDNR Fisheries Biologist. Any required permits will be obtained prior to installation. Consult the attached specifications and/or job sheets for details and component practices necessary for establishment and maintenance of this practice.

**395-Stream Habitat Improvement and**

**Management –C–**Adjoining riparian corridors and floodplains will be managed with vegetation suitable for the site conditions and desired ecological benefits which may include: stream temperature moderation, recruitment of instream large wood and fine organic debris, input of riparian nutrients and terrestrial insects; stream bank stability; and flood attenuation. Any required permits will be obtained prior to installation. Additional component practices and their respective specifications may be required to fully implement this practice.